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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Antoni Gienic

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1695

7590

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SUITE 2100

LOUISVILLE, KY 40202

EXAMINER

YI, STELLA KIM

ART UNIT

PAPER NUMBER

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/537,530	<b>Applicant(s)</b> GIENIC ET AL.	
	<b>Examiner</b> Stella Yi	<b>Art Unit</b> 1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 January 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/30/2008, 10/11/2005, 06/29/2005</u> .                      | 6) <input type="checkbox"/> Other: _____                          |



## **DETAILED ACTION**

### ***Response to Amendment***

1. The Amendment filed on January 30, 2009 has been entered and fully considered.

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-3, 7-16, 17-19, 21-23, 28-31, and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over ROBINS (3,409,579) and "Translation from ROEMPP's Chemie Lexikon" (10<sup>th</sup> Edition) and in further view of SAEKI et al. (4,426,484).

Regarding claims 1-3, 12-14, 16, 17, 19, 21, 22, 31, and 35 ROBINS discloses a process for producing shaped bodies in foundry technology (Col.1, lines 34-42), which comprises:

preparing a composition comprising blending a novolac phenolic resin , a polyisocyanate, and a refractory material; and molding the composition to form a shaped body; and contacting the shaped foundry mix with a tertiary amine until the binder has cured (Col.3, lines 48-62; Col.6, lines 50-58; Col.12, lines 34-36).

ROBINS discloses that the blending of the said composition is carried out under ambient conditions (Col.2, lines 44-45) but does not explicitly disclose blending the said

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materials below the melting point of the phenolic resin. However, it would have been obvious to one of ordinary skill in the art to blend the said materials below the melting point of the phenolic resin prior to molding the said composition in order to avoid the curing of the resin before shaping of the composition.

ROBINS does not explicitly disclose curing the said composition with heat above the melting point of the phenolic resin. However, ROEMPP discloses that novolac phenolic resins are cured faster by cross-linking at increased temperatures of 140-180°C (Page 4), which is above the melting point of the phenolic resin. ROBINS discloses that phenolic resins have been widely used as foundry binders and that considerable heating is required to cause the novolac resins to become cross-linked (Col.3, lines 23-24) and that rapid curing of the composition is necessary (Col.2, lines 43-46). Therefore, it would have been obvious to one of ordinary skill in the art to raise the temperature of the shaped body to above the melting point of the phenolic resin in order to cure the composition.

ROBINS is silent to the phenolic resin being in solid form. However, SAEKI et al. teach a solid phenolic resin used in foundry applications, refractories, molding material and so forth (Col.1, lines 14-19; 36-38). It would have been obvious to one of ordinary skill in the art to have substituted the solid phenolic resin as taught by SAEKI et al. for the phenolic resin in ROBINS because SAEKI et al. teach that the solid resole type phenolic resin not only can be accelerated in its curing reaction but also the heat cured articles are higher in crosslinking density and are excellent in mechanical strength and hardness (Col.3, lines 13-20).

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Regarding claim 2 and 23, ROBINS discloses that the said refractory material is mixed with the phenolic resin to produce a mixture prior to addition of the polyisocyanate (Col.3, lines 57-61; Col.6, lines 52-58).

Regarding claims 7, 18, ROBINS discloses the production of the shaped body being carried out without addition of a solvent (Col.3, lines 61-75; Col.7, lines 10-15).

Regarding claims 8, 9, 10, 11, and 28-30, ROBINS discloses a liquid aromatic polyisocyanate (Col.5, lines 62-75) comprising an isocyanate having at least 2 isocyanate groups per molecule (Col.3, lines 54-55) is dissolved in a solvent in which the phenolic resin is insoluble or sparingly soluble (Col. 4, lines 57-60; Col.6, lines 35-38).

Regarding claim 15, ROBINS discloses that adding a catalyst to the composition (Col.1, lines 60-64).

3. Claims 4, 5, 20, 24-26, and 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over ROBINS (3,409,579), "Translation from ROEMPP's Chemie Lexikon" (10<sup>th</sup> Edition), and SAEKI et al. (4,426,484) as applied to claims 1-3, 7-16, 17-19, 21-23, 28-31, and 35 above, and in further view of EL-DEMALLAWY et al. (2003/0183364).

The teachings of ROBINS, ROEMPP's, and SAEKI are applied as described above for claims 1-3, 7-16, 17-19, 21-23, 28-31, and 35.

Regarding claims 4, 5, 20, 24-26, and 32-34 ROBINS discloses sequentially admixing the binder components with sand or refractory materials but is silent to the type of refractory material. However, EL-DEMALLAWY et al. discloses hollow

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microspheres comprising aluminosilicate with a content ranging from 20-50% by weight that is mixed with phenolic resin and polyisocyanate components to produce a mould (shaped body) (Page 2, [0018], [0024], [00022]). It would have been obvious to one of ordinary skill in the art to have modified the process for producing shaped bodies of ROBINS to include the aluminosilicate of EL-DEMALLAY et al. in place of the said sand aggregates of ROBINS in order to produce shaped bodies with thermally insulating properties that would manifest excellent heat retention (Page 2, [0020]).

4. Claims 6 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over ROBINS (3,409,579), "Translation from ROEMPP's Chemie Lexikon" (10<sup>th</sup> Edition), and SAEKI et al. (4,426,484) as applied above to claims 1-3, 7-16, 17-19, 21-23, 28-31, and 35, and in further view of MIKI (6,372,032).

The teachings of ROBINS, ROEMPP's, and SAEKI are applied as described above for claims 1-3, 7-16, 17-19, 21-23, 28-31, and 35.

Regarding claims 6 and 27, ROBINS is silent to adding an exothermic constituent to the composition. However, MIKI discloses a process for producing a foundry exothermic assembly by mixing an exothermic constituent such as an oxidizable metal with a refractory aggregate and phenol-urethane resin (phenolic resin and polyisocyanate) (Col.1, lines 5-14; Col.2, lines 58-61; Col.3, lines 5-14). It would have been obvious to one of ordinary skill in the art to have modified the process for producing shaped bodies of ROBINS to include an exothermic constituent of MIKI in order to produce shaped bodies that would enable high-yield production of excellent

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quality castings substantially free of defects such as defective castings (Col.3, lines 39-41).

### ***Response to Arguments***

1. Applicant's arguments with respect to "resin in solid form", see page 11-14 of the Remarks, filed January 30, 2009, with respect to the rejection(s) of claim(s) 1-3, 12-14, 16, 17, 19, 21, 22, 31, and 35 under 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of SAEKI et al.

(4,426,484).2. Applicant argues:

- a) Robins teaches away from the concept of heating the phenolic resin and Roempp does not add to the teaching of Robins.
- b) El-Demallawy et al. do not add to the teaching of Robins and/or Roempp to disclose the invention as disclosed and claimed by the Applicants.
- c) Subject matter of Claim 1 is also not disclosed by Miki alone or in combination with Robins and/or Roempp.

Examiner respectfully disagrees with the Applicant's above arguments and would like to point out the reason(s) as discussed in the rejection:

- a) In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the



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references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Robins discloses that heating has generally been employed to cause the isocyanate to react with the phenolic resin either through the phenolic hydroxyl group or through the methylol group in order to achieve the formation of cross-linking urethane bonds (Col.3, lines 8-13). Therefore, heating has been used to cure the phenolic resin in previous art. Robins utilized a tertiary amine instead to cure the composition at room temperature. ROBINS disclosed a reaction between phenolic resin and an polyisocyanate with the formation of polyurethane can occur with heating but does not explicitly disclose curing the said composition with heat above the melting point of the phenolic resin. However, ROEMPP discloses that novolac phenolic resins are cured faster by cross-linking at increased temperatures of 140-180°C (Page 4), which is above the melting point of the phenolic resin. ROBINS discloses that phenolic resins have been widely used as foundry binders and that considerable heating is required to cause the novolac resins to become cross-linked (Col.3, lines 23-24) and that rapid curing of the composition is necessary (Col.2, lines 43-46). Therefore, it would have been obvious to one of ordinary skill in the art to raise the temperature of the shaped body to above the melting point of the phenolic resin in order to cure the composition.

b) Discussion of part a) further applies. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to

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produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, regarding claims 4, 5, 20, 24-26, and 32-34 ROBINS discloses sequentially admixing the binder components with sand or refractory materials but is silent to the type of refractory material. However, EL-DEMALLAWY et al. discloses hollow microspheres comprising aluminosilicate with a content ranging from 20-50% by weight that is mixed with phenolic resin and polyisocyanate components to produce a mould (shaped body) (Page 2, [0018], [0024], [00022]). It would have been obvious to one of ordinary skill in the art to have modified the process for producing shaped bodies of ROBINS to include the aluminosilicate of EL-DEMALLAY et al. in place of the said sand aggregates of ROBINS in order to produce shaped bodies with thermally insulating properties that would manifest excellent heat retention (Page 2, [0020]).

c) Discussion of part a) further applies In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Regarding claims 6 and 27, ROBINS is silent to adding an

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exothermic constituent to the composition. However, MIKI discloses a process for producing a foundry exothermic assembly by mixing an exothermic constituent such as an oxidizable metal with a refractory aggregate and phenol-urethane resin (phenoli resin and polyisocyanate) (Col.1, lines 5-14; Col.2, lines 58-61; Col.3, lines 5-14). It would have been obvious to one of ordinary skill in the art to have modified the process for producing shaped bodies of ROBINS to include an exothermic constituent of MIKI in order to produce shaped bodies that would enable high-yield production of excellent quality castings substantially free of defects such as defective castings (Col.3, lines 39-41).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stella Yi whose telephone number is 571-270-5123. The examiner can normally be reached on Monday - Thursday from 8:00 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SY

/Christina Johnson/

Supervisory Patent Examiner, Art Unit 1791